



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/594,543

09/28/2006

Akio Yamagiwa

DK-US065247

1917

22919 7590 04/15/2009
GLOBAL IP COUNSELORS, LLP
1233 20TH STREET, NW, SUITE 700
WASHINGTON, DC 20036-2680

EXAMINER

MOK, ALEX W

ART UNIT

PAPER NUMBER

2834

MAIL DATE

DELIVERY MODE

04/15/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/594,543	Applicant(s) YAMAGIWA, AKIO	
	Examiner ALEX W. MOK	Art Unit 2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 December 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) 28-34 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27 and 35-37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Amendment

1. Acknowledgement is made of Amendment filed December 30, 2008.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

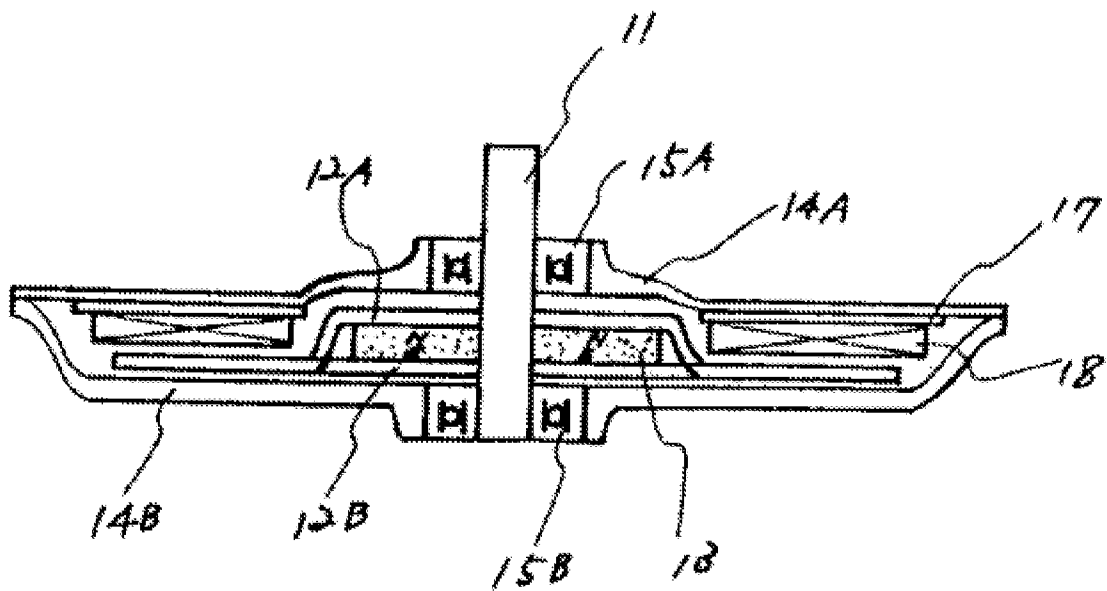
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 2, 4-8, 15 and 35-37 are rejected under 35 U.S.C. 102(b) as being anticipated by Kakizawa (Japanese Patent Document No.: JP 59216459 A).

For claim 1, Kakizawa discloses a motor comprising an armature (17) and a field element (figure 2) which are rotatable relative to each other on a rotation axis extending in a first direction, wherein said armature (reference numeral 17) includes an armature winding (reference numeral 18) which is placed at a distance in a second direction perpendicular to said first direction, from said rotation axis (reference numeral 11), and said field element includes: a plurality of first yoke plates (reference numerals 12A, 12B) each including one end which faces said armature winding (18) in said first direction and the other end which does not face said armature winding (18) in said first direction (figure 2), each of said plurality of first yoke plates (12A, 12B) extending in said second direction; and a magnetic-field creating magnet (reference numeral 13) which has a north pole joined to said other end of one of adjacent first yoke plates (12A, 12B) of said

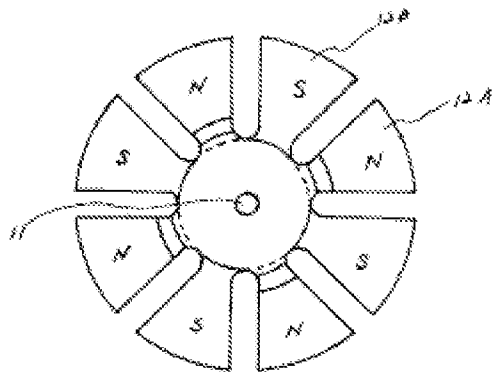
Art Unit: 2834

plurality of first yoke plates, a south pole joined to said other end of the other of said adjacent first yoke plates (see figure 2, 3), and this configuration would cause a U-shaped magnetic path which opens to said plurality of first yoke plates, said magnetic-field creating magnet at least locally facing said armature winding in said second direction (see figure 2).



第 2 図

For claim 2, Kakizawa illustrates one end of said adjacent first yoke plates (12A, 12B) being connected to each other (see figures 2, 3).



第 3 圖

For claim 4, Kakizawa illustrates for each of said plurality of first yoke plates a linear outline parallel to said second direction (figure 3).

For claims 5 and 6, Kakizawa illustrates the interval between said adjacent first yoke plates increasing (non-linearly) as a distance from said rotation axis increases in said second direction (see figure 3).

For claim 7, the magnet of Kakizawa in figure 2 would have to be disc-shaped in the motor for proper operation of the motor.

For claim 8, Kakizawa discloses said magnetic-field creating magnet including at least one permanent magnet in which a north pole and a south pole are laid side by side in said first direction (reference numeral 13, figure 2), and a second yoke plate which joins said north pole and said south pole of said permanent magnet on a side opposite to a side on which said plurality of first yoke plates are placed (reference numerals 12A, 12B, see figure 2).

For claim 15, Kakizawa discloses the armature including a substrate on which said armature winding is placed (reference numeral 17, figure 2).

For claims 35-37, since Kakizawa already teaches the claimed motor as explained above for claim 1, this motor can inherently be applied to any type of device for the purpose of driving the device, such as for rotating a fan in a blower, rotating a compressing mechanism, and rotating a rotation driving mechanism for an air conditioner.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 3, 12, 13, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kakizawa (Japanese Patent Document No.: JP 59216459 A).

For claim 3, Kakizawa teaches the claimed invention but does not specifically disclose the other ends of said adjacent first yoke plates being connected to each other such that a junction between said other ends of said adjacent first yoke plates does not overlie a boundary between said north pole and said south pole. It still would have been obvious to have this configuration since this would just involve a mere change in the location of the component which is generally a routine skill in the art, and a person

Art Unit: 2834

of ordinary skill would have applied this for the purpose of improving the efficiency of the motor.

For claims 12 and 13, Kakizawa teaches the claimed invention but does not specifically teach a width of the second yoke plate being larger than the width of the permanent magnet in either the first or second direction. It would have been obvious to have this configuration since changing the size of a component is generally recognized as a routine skill, and a person of ordinary skill would have been motivated to apply this configuration for the purpose of preventing the magnetic fluxes from saturating the plate.

For claim 22, Kakizawa already discloses the yoke plates having a first and second flat portion being connected to each other (reference numerals 12A, 12B, figures 2, 3), but does not specifically disclose the first flat portion being placed closer to said armature winding than said second flat portion in said first direction. It still would have been obvious to have this configuration since Kakizawa discloses the yoke plate being bent so that one surface has a different axial displacement than another surface of the yoke plate (see figure 2), and a person of ordinary skill would have been able to apply this technique for the purpose of reducing the air gap and improving the efficiency of the motor.

6. Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kakizawa as applied to claims 1 and 8 above, and further in view of Umehara (US Patent No.: 5581422).

For claims 10 and 11, Kakizawa teaches the claimed invention except for a bonded-magnet and the magnet being formed integrally with either said plurality of first yoke plates or said second yoke plate by injection molding. Umehara discloses using injection molding to integrally form the magnets with the yoke plates (see column 7, lines 22-29). It would have been obvious to have this configuration since selecting a type of material such as a bonded magnet is generally recognized as an ordinary skill in the art, and the teachings of Umehara could have been applied by a person of ordinary skill for the purpose of reducing the size of the motor.

7. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kakizawa as applied to claim 1 above, and further in view of Whiteley (US Patent No.: 4605874).

For claim 9, Kakizawa teach the second yoke plate as explained for claim 8 above, but does not teach the magnets having a hexahedron shape. Since Whiteley illustrates segmented magnets with a hexahedron shape (reference numeral 36, figure 2), it would have been obvious for a person of ordinary skill to have at least two hexahedron-shaped permanent magnets in each of which a north pole and a south pole are laid side by side in said first direction for the purpose of improving the efficiency of the motor.

8. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kakizawa as applied to claims 1 and 8 above, and further in view of Takahashi (US Patent No.: 6208055).

For claim 14, Kakizawa teaches the claimed invention except for a portion extending along a portion of said permanent magnet where different polarities are adjacent having a larger width extending in said first direction than said other portions in said second yoke plate. Since Takahashi discloses a configuration of a back yoke (reference numeral 222) with a magnet body disposed on the yoke (reference numeral 224) where portions of the yoke have larger widths than the rest of the yoke (see figures 8, 9), it would have been obvious to a person of ordinary skill to apply this technique for the purpose of preventing saturation of fluxes in the yoke plate.

9. Claims 16, 17, 19, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kakizawa as applied to claims 1 and 15 above, and further in view of Isozaki et al. (US Patent Application Pub. No.: US 2003/0052553 A1).

For claim 16, Kakizawa teaches the claimed invention but does not disclose the armature winding being placed on each of surfaces of said substrate which are opposite to each other in said first direction. Since Isozaki et al. disclose a motor with windings disposed on both sides of a substrate (reference numerals 2A1-2A6, 2B1-2B6, figure 1), it would have been obvious to a person of ordinary skill to include this for the purpose of allowing a more flexible arrangement for the windings.

For claim 17, Kakizawa teaches the claimed invention except for the armature winding placed on one of said surfaces of said substrate and the armature winding placed on the other of said surfaces of said substrate being misaligned with each other in a rotation direction of said field element which is defined based on said armature.

Art Unit: 2834

Since Isozaki et al. disclose a similar configuration for the windings (reference numerals 2A1-2A6, 2B1-2B6, see figure 2), it would have been obvious to a person of ordinary skill to include this for the purpose of reducing noise and improve the efficiency of the motor.

For claim 19, Kakizawa illustrates in figure 2 the armature and the field element being paired to form one motor set, and it would have been obvious to have a plurality of motor sets being connected so they can be arranged in said first direction, with the plurality of motor sets being centered on said rotation axis in common, since Isozaki et al. illustrate this configuration in figure 1, and a person of ordinary skill would have been able to apply this technique for the purpose of efficiently providing a plurality of sets in the motor.

For claim 20, it would have been obvious to have the armature windings respectively included in said plurality of motor sets be misaligned with one another in a rotation direction of said field element which is defined based on said armature, for the same reasons given for claim 17 above.

10. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kakizawa as applied to claims 1 and 15 above, and further in view of Kim (US Patent No.: 6005324).

For claim 18, Kakizawa teaches the claimed invention except for the armature winding being a flat coil in which a conductor is formed by a photolithographic process. Since Kim discloses a brushless motor wherein the coils are formed by a

Art Unit: 2834

photolithographic process (see column 4, lines 1-13), it would have been obvious for a person of ordinary skill to include this for the purpose of integrally forming the winding and the substrate to achieve thinning of the motor.

11. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kakizawa as applied to claim 1 above, and further in view of Isozaki et al. (US Patent Application Pub. No.: US 2003/0052553 A1) and Hashimoto (Japanese Patent Document No.: JP 06022526 A).

For claim 21, Kakizawa teaches the claimed invention except for the field element and another field element similar to said field element being connected to each other so that they are arranged in said first direction with said armature being interposed therebetween, where field elements are centered on said rotation axis in common. It would have been obvious to include this configuration since Isozaki et al. disclose a similar configuration as shown in figure 1 and explained for claim 19, but does not disclose the armature winding being placed closer to said rotation axis than said magnetic-field creating magnet. It also would have been obvious to have this structure since Hashimoto discloses a motor having windings (reference numeral 53) being closer to the rotation axis than the magnets (reference numeral 51, see figure 1), and a person of ordinary skill would have been able to include this for the purpose of making the motor thinner.

Art Unit: 2834

12. Claims 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kakizawa as applied to claim 1 above, and further in view of Ushiro (US Patent No.: 5679990).

For claims 23 and 24, Kakizawa teaches the claimed invention except for at least one position detection sensor and having it placed in a substantially central region of said armature winding. Since Ushiro discloses a motor having a position sensor for an armature (reference numeral 9, figure 1), it would have been obvious to a person of ordinary skill to include this to detect the position of the poles of the magnet, and it also would have been obvious to have the sensor displaced with respect to a line extending from said rotation axis to a substantially central region of said armature winding in a direction opposite to a rotation direction of said field element which is defined based on said armature, since this would involve a mere change in the location of the sensor component, which is generally recognized as being within the level of ordinary skill in the art.

13. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kakizawa and Ushiro as applied to claims 1 and 23 above, and further in view of Gotou et al. (US Patent No.: 5729102).

For claim 25, Kakizawa and Ushiro disclose the claimed invention except for having drive means for supplying either rectangular-wave or sinusoidal drive current to said armature winding based on an output of said position detection sensor. Since Gotou et al. disclose a similar configuration for a brushless motor having currents that

Art Unit: 2834

are driven to the windings being controlled by the signals from the sensor (see the Abstract), it would have been obvious to a person of ordinary skill to include this for the purpose of simplifying the drive circuit and improving the efficiency.

14. Claims 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kakizawa as applied to claim 1 above, and further in view of Inagawa et al. (US Patent Application Pub. No.: US 2003/0107348 A1).

For claims 26 and 27, Kakizawa teaches the claimed invention except for the means for detecting an induced voltage of said armature winding, means for estimating a position of a magnetic pole of said magnetic-field creating magnet from said induced voltage, and drive means for supplying a drive current based on said estimated position of said magnetic pole of said magnetic-field creating magnet to said armature winding. Since Inagawa et al. disclose a similar technique where the position of the rotor is determined by the voltage induced in the winding (see paragraph [0022]), it would have been obvious to a person of ordinary skill to include this configuration for the purpose of eliminating the need of a sensor and make the motor thinner. It also would have been obvious to have the drive means set a phase of said drive current forward to a phase of said induced voltage since this would just involve adjusting the drive means taught by Inagawa et al. by an ordinary skill in the art for the purpose of avoiding the phase lag of the current and improving the efficiency of the motor.

Response to Arguments

15. Applicant's arguments filed December 30, 2008 have been fully considered but they are not persuasive. In response to the reference of Kakizawa not disclosing a U-shaped magnetic path, the structural components as recited in claim 1 are still taught by Kakizawa, as the reference discloses the magnetic-field creating magnet having a north pole joined to the other end of one of adjacent first yoke plates of the plurality of first yoke plates, and a south pole joined to the other end of the other of the adjacent first yoke plates, as explained above in the present action, and since this meets the structural limitations of the apparatus claim, this would be able to create the U-shaped magnetic path opening to the first yoke plates. In response to the remarks regarding the rejection of claim 8, the claims still do not recite any additional limitations regarding the polar characteristics for the yoke plates, therefore the reference of Kakizawa discloses the invention as claimed. Also a person of ordinary skill would still be able to use the reference of Whiteley in combination with Kakizawa for the invention of claim 9 since both of these inventions involve motors with armature windings and magnets on the field elements, and together would teach the limitations of claim 9 as explained above.

Conclusion

16. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEX W. MOK whose telephone number is (571)272-9084. The examiner can normally be reached on 7:30-5:00 Eastern Time, 1st Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Quyen P. Leung can be reached on (571) 272-8188. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2834

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Quyen Leung/
Supervisory Patent Examiner, Art Unit 2834

/A. W. M./
Examiner, Art Unit 2834